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ABSTRACT

The use of personal computers by juniors and faculty at Clarkson University, an engineering college, was investigated in December 1985 as a followup to a 1984 study. Starting in August 1983, the university required entering freshmen to purchase their own personal computer, the Zenith Data System Z-100. Randomly selected, a total of 15 faculty members and 25 juniors completed faculty/student questionnaries. Findings for the faculty respondents include: most faculty have incorporated the Z-100 into their courses; some use the computer as a word processor for writing exams; some require students to write computer programs to solve problems in their courses; others use software and computer games to teach important concepts; and others have created their own software and designed it to fit their courses. Students use the Z-100 for tutorial purposes, for running software, and as a word processor in courses that require written work. They also interface the computer to a laboratory instrument to collect, analyze, and plot data. Three programs developed at the university are briefly described, along with a computer concept course taught at the university. (SW)

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THE ACADEMIC USE OF THE Z-100 BY UNDERGRADUATES AND THEIR PROFESSORS AT CLARKSON UNIVERSITY: A FOLLOW UP STUDY

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ABSTRACT: A follow up survey of users of the Zenith Z-100 microcomputer at Clarkson University is offered.

KEYWORDS: survey, microcomputer, uses in higher education.

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INTRODUCTION

Clarkson University is an engineering college located in northeastern New York. It is well known for its undergraduate education in engineering, management and science.

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It was the first college in the nation to establish a policy that every entering Freshman student would purchase their own personal computer. The policy was implemented in August 1983 and at that time all entering Freshmen were provided with the Zenith Data Systems Z-100.

I conducted a survey in February of 1984 to find out how and to what extent the Z-100 was being used in various courses at Clarkson by its Freshmen students and their professors. My survey results showed that the two main student uses of the Z-100 were as a word processor and for writing computer programs. The results also indicated that most faculty members were using the Z-100 or planning to eventually implement it into their courses. After the publication of my article entitled,"The Academic Use of the Z-100 by Freshmen and Professors at Clarkson University," I received numerous requests for a follow up study. This article is my response to those requests. It is based on a survey I conducted in December 1985.

EXPERIMENTAL DESIGN

The two populations considered in this survey were the Junior students and the Faculty at Clarkson University. A random sample of each was selected to fill out questionnaires.

A sample of 15 faculty members answered a faculty questionnaire. The sample was randomly selected from an approximate total of 240 professors. The sample consisted of 13 males and 2 females. Departments included in the sample were Accounting and Law, Math and Computer Science, Chemistry, Management, Psychology, Aerospace Studies, Economics and Finance, Physics, Biology, Mechanical and Industrial Engineering, Marketing and Computer Based Management Systems, Liberal Studies and Technical Communications.

A sample of 25 Junior students filled out Junior student questionnaires. The sample was randomly selected from an approximate total of 950 students. The sample consisted of 8 females and 17 males. Out of the students surveyed 22 of them were 20 years of age and the remaining three were 21, 24, and 26 years old. Students' majors included in the sample were Industrial Distribution, Electrical Engineering, Mechanical Engineering, Accounting, Chemistry, Computer Science, Technical Communications, Computer Based Management Systems, Industrial Marketing, and Civil Engineering.

RESULTS

Most faculty surveyed have incorporated the Z-100 into their courses. Some use the computer as a word processor for writing exams. Some professors require students to write computer programs to solve problems in their courses. Others use software and computer games to teach important concepts. Still others have created their own software and designed it to fit their courses. A professor in Organic Chemistry has written software to help students better understand the structure of molecules. The Computer Department sends some mail electronically. The Science Department has incorporated the computers into their lab work. The computers are interfaced to laboratory instruments and they gather, analyze, and plot data.

Clarkson has developed ZPILOT to aid their instructors. It is an advanced version of the PILOT language. PILOT is designed for creating instructional programs in which the student interacts with the computer. Professor Dennis Horn of Clarkson University has used ZPILOT to write a group of invention programs to help students generate ideas for their written assignments. These programs ask a student about his or her writing assignment and then generate a printed outline. Professor Horn has completed a series of ZPILOT programs

which write other ZPILOT programs. This allows instructors to create their own invention programs simply by entering a sequence of questions into the machine. Thus they can easily create programs to help students master concepts and writing principles discussed in class. Professor Horn also wrote a program called LANCELOT that contains a spelling checker, sentence analyzer and more. In addition to the above tools, Clarkson students and instructors have available to them a word processing program known as GALAHAD. It allows them to prepare a paper on the computer screen and to easily move, delete, or substitute paragraphs, sentences and words.

Liberal Studies professors are enthusiastic with the Z-100 program and attribute its use to an improvement in the quality of students' papers. These professors use the program to enhance student writing skills. One professor often has students send him drafts of their essays via electronic mail and he sends suggestions back to them electronically. Another has conferences with some students about papers they presented to him on disk and they do on-the-spot revision. He believes this is a powerful tool for teaching writing.

SUMMARY OF THE Z-100's USE AT CLARKSON UNIVERSITY TO TEACH WRITING SKILLS

1. Each student at Clarkson University owns a personal computer. Therefore the computer is available and accessible when needed.

2. The microcomputers are easy to use and user friendly.

3. The students have very good software on writing skills available to them.

   A. ZPILOT- This is an advanced version of the PILOT Language (designed to create instructional programs in which the student interacts with the computer). Professor Dennis Horn of Clarkson University has used ZPILOT to write a group of invention programs to help students generate ideas for their written assignments. These programs ask a student about his or her writing assignment and then generate a printed outline.

   B. LANCELOT- This is a program written by Professor Horn that contains a spelling checker, sentence analyzer and more.

   C. GALAHAD - This is a word processing program that allows students to prepare a paper on the computer screen and to easily move, delete or substitute paragraphs, sentences and words,

4. The use of computers allows students and professors to send drafts of essays and suggestions back and forth via electronic mail.

5. Some professors have students present papers on disks to them and they do on-the-spot revision. This appears to be a powerful tool for teaching writing.

6. The Liberal Studies professors are enthusiastic with the Z-100 program and attribute its use to an improvement in the quality of students' papers.

7. The Z-100 program appears to have done a great deal to boost student attitudes toward essay writing.

8. The students are motivated because they have their own computers available when needed and also because the available programs like LANCELOT have allowed them to expediently write & revise papers.

All the students surveyed are using computers in their courses. In order to use the computer students must be familiar with its languages. Language processors provided to Clarkson students are Fortran, Pascal, Zbasic and Multiplan. The Management students are taught Basic and introduced to Multiplan. The Engineering students are taught to use Fortran and the Science students learn both Fortran and Pascal. The following is a discussion of how some students at Clarkson University have acquired language skills in Basic.

A computer concept course taught at Clarkson used the Z-100 to teach Principles and Programing. The principles part of the course involved students learning hardware, software and systems concepts on their own using Computer-Assisted Instruction (CAI). Lectures were not given on the material in class. The students were assigned reading from a Principles textbook. They were given a diskette which contained mini-quizzes to help them evaluate their level of understanding of the textbook material. The programing part of the course involved teaching Basic programing to the students during their scheduled classes. The students completed program assignments (during the course) ranging from simple programs using DATA statements and one simple loop to a set of programs written for data entry into files and data analysis and reporting. The final Basic programing assignment required students to write a menu-driven program that would allow a user to accomplish data entry from source documents, update a master file and generate many reports for an

inventory application. Professors of this course felt the CAI material and the use of the Z-100 made it possible for them to cover more material with their students than otherwise could have been done. Thus students acquired many skills in Basic that could be applied to future courses. Most students had a positive attitude toward the Z-100 program and felt it benefited them.

The two main student uses of the Z-100 appear to be as a word processor and for writing computer programs. This usage has been greatly expanded since my first survey. Now students are not just writing computer programs in computer type courses but in other courses as well (ex. Math and Science). Students use the Z-100 as a word processor in their Liberal Studies' courses to write papers and in Science courses to write lab reports. In general we can say that students are now using the Z-100 as a word processor in courses that require written work. They also use the Z-100 for tutorial purposes and for running software. In addition, the students are using the Z-100 in their laboratory work. Here the computer is interfaced to a laboratory instrument in such a way that it is able to collect, analyze, and plot data.

CONCLUSION

The Z-100 is being used extensively at Clarkson University by its Faculty and students. The Z-100 program appears to have done a great deal to boost student attitudes toward essay writing. The students are not only motivated because they have their own computers available when needed but also because the available programs like LANCELOT and GALAHAD have allowed them to expediently write and revise papers. The Faculty are so enthusiastic that they are preparing their own software and designing it to fit their courses. The Fall of 1986 all undergraduates at the college will have their own computer. The Z-100 can then be incorporated into all areas of study. With at least one Z-100 computer in each dormitory room and one or more in each office on campus all that would be lacking is a connection between the machines. A computer link would have a drastic impact on college communication. It is believed that the time will come when a student can check the dining hall menu, see what movie is playing at the college theater and much more, all by computer.

REFERENCES

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BIOGRAPHICAL SKETCH

Dana M. Barry received the BA and MS in Education from the State University College of New York at Potsdam, an MS in Chemistry from Clarkson University, and a PhD in Education from Columbia Pacific University. She has taught high school and is a former Chemical Consultant and Chemical Engineer. Doctor Barry has a great interest in microcomputers and education. She is presently a Faculty Mentor for Columbia Pacific University and a Proposal Writer for the State University College at Potsdam, New York.